PATENT SPECIFICATION

(11) 1 487 302

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(21) Application No. 38653/73 (22) Filed 15 Feb. 1974
(23) Complete Specification filed 10 Jan. 1975
(44) Complete Specification published 28 Sept. 1977
(51) INT CL² E04G 5/08
(52) Index at acceptance E1S 2

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(54) SCAFFOLD BOARDS

(71) We, CEMENTATION CHEMICALS LIMITED, a British Company, of 681 Mitcham Road, Croydon, Surrey, do hereby declare the invention, for we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to scaffold boards.

Scaffold boards are boards which are usually wooden and are placed on an iron or steel scaffold to provide a surface to support workmen and their tools. Wooden scaffold boards normally comply with British Standard Specification No. 2482:1970. Amongst the requirements of this specification are that a wooden scaffold board shall be not less than 38 mm. thick, not greater than 225 mm. wide and not greater than 4.8 m ± 50 mm. long and shall be able to support a uniformly distributed load of 6.7 kilo Newtons/squ.m. when supported at 1.2 m. centres.

Wood is not a particularly suitable material for scaffold boards. It is desirable that the properties of a scaffold board should be uniform throughout the board. Wood is not uniform in its properties and make up and therefore wood for use as scaffold boards has to be selected with care to ensure that it is of sufficient grading and uniform quality and that it does not contain too many knots. Furthermore wood tends to splinter and a wooden scaffold boards which has splintered is a safety hazard. Splintering can cause an otherwise satisfactory wooden scaffold board to be discarded. Wood is also subject to rot and decay which are insidious and can render an apparently sound board unsafe. In addition wooden boards may be put to various uses on site and so they become altered and unsuitable for the original use.

According to the present invention there is provided a scaffold board which is made of a plastics material containing fibre reinforcements and which can support a uniformly distributed load of 6.7 kilo Newtons/squ.m. when supported at 1.2 m centres, wherein the fibre reinforcements comprise unidirectional continuous rovings and one or both of chopped strand mat and woven rovings.

While a scaffold board of the invention must comply with the strength requirements of British Standard Specification No. 2482: 1970, such a scaffold board need not be as thick as 38 mm. Furthermore a scaffold board can have a width greater than 225 mm, even as much as 450 mm. and still comply with the load requirement. The scaffold board of the invention can be considerably lighter than a conventional wood scaffold board of the same area and, because of the uniform nature of the plastics material, scaffold boards which are larger than conventional wooden ones can be made. The use of larger scaffold boards reduces transport and erection costs.

The plastics material from which the scaffold board is made is preferably a polyester material, for example a polyester of orthophthalic anhydride and propylene glycol which is cross-linked with styrene. This material is commercially available from Scott Bader Co. Ltd. under the name CRYSTIC 506 or BIP859 ("CRYSTIC" is a Registered Trade Mark). The fibre reinforcements may comprise random fibres as well as unidirectional continuous rovings and one or both of chopped strand mat and woven rovings. Suitable reinforcement is glass fibre. For compressive strength use may be made of chopped strand mat, which is commercially available under the trade names SUPREMAT (Registered Trade Mark) or FGE5000 from Fibreglass Ltd. Compressive strength is required at points of high local load, for instance at the support centres on the metal scaffolding itself which would tend to compress the board. For lateral and longitudinal strength woven rovings may be used. The unidirectional continuous rovings are particularly valuable for providing local very high tensile strength. High tensile strength is required near the surface of the board to improve flexural response, i.e. when the board flexes the top and bottom layers are put alternatively in compression and tension. The scaffold board can be made by hand lay-up techniques or by injection mould-

ing methods using specially machined and coated moulds. To prevent the scaffold board from flexing in use it can be braced by members of wood or other suitable material extending along the longer edges or all round the scaffold board or as inserts within the body of the board.

Preferably the scaffold board is given a non-slip surface. This can be done by making an embossed tread pattern during manufacture or by applying a fine aggregate such as sand or any other material with a high polished stone value to the surface of the board after manufacture. Whilst a coarse glass paper type finish gives an adequate non-slip surface a combination of embossed check-plate and roughened surface is preferred.

Boards can be made in a variety of shapes, for example they may have a raised portion of coaming along one or both edges of the board. They may be single or double-sided.

The scaffold board can be coloured in manufacture by incorporating a pigment in the plastics material so that, for example, boards of different sizes can be given different identifying colours. As the colour will extend throughout the scaffold board, it cannot wear, chip or flake off as in the case of painted wooden boards. The board may be lightened by using as a core lightweight material such as low density foam, for example foamed polyurethane available from Coolag Ltd. or Baxenden Chemicals Ltd.

The invention will be further illustrated with reference to the accompanying drawings showing, by way of example, embodiments in accordance with the invention, in which:

Figure 1 is cross-section of a scaffold board in accordance with the invention;

Figure 1*a*, 1*b* and 1*c* are enlargements of portions of Figure 1 to show details; and

Figure 2 is a cross-section of a scaffold board of different design.

Figure 1 shows a single-sided scaffold board 1 which is lightened by the use of low density foam inserts 2, 3 and 4, suitably of polyurethane. The inserts 2, 3 and 4 extend longitudinally through the scaffold board. The upper surface 5 of the board comprises a zone which is free from reinforcements and is known as the gel coat, beneath which is reinforcement in the form of woven rovings 6. The lower surface 7 of the board is reinforced with chopped strand mat. The interior of the board, apart from the volume occupied by the inserts 2, 3 and 4 is reinforced by woven rovings. The volume immediately surrounding the inserts and between the inserts and the gel coat of the upper surface 5 and the chopped strand mat of the lower surface 7 is also reinforced by woven rovings. A layer of continuous longitudinally extending rovings 8 is positioned between each of the inserts and the woven rovings on that side of the inserts adjacent to the lower surface of the board (see Figure 1*c*).

Figure 2 shows a double-sided scaffold board which has even upper and lower surfaces 5 and 7 respectively. The interior of the board is filled with woven rovings 6. Between the woven rovings and the upper and lower surfaces of the board are continuous longitudinally extending rovings 8.

A wooden scaffold board and a reinforced plastics scaffold board as shown in Figure 1 were subjected to various tests. The results of the tests are given in Table 1 below.

TABLE I

	Timber Board	G.R.P. Board
Weight	9.8 kilos	9.1 kilos
Withstand 6.7 KN M^2	Yes	Yes
Deflection at 6.7 KN M^2	6 mm	7.5 mm
Loading at Cracking Point	8 × 6.7 KN M^2	8 × 6.7 KN M^2
Effects on board after cracking	completely broken	Still capable of withstanding 6.7 KN M^2 but deflects 30 mm

WHAT WE CLAIM IS:—

1. A scaffold board which is made of a plastics material containing fibre reinforcements and which can support a uniformly distributed load of 6.7 kilo Newtons/squ.m. when supported at 1.2 m centres, wherein the

fibre reinforcements comprise unidirectional continuous rovings and one or both of chopped strand mat and woven rovings.

2. A board as claimed in claim 1, wherein the plastics material is a polyester material.

3. A board as claimed in claim 2, wherein the plastics material is a polyester of orthophthalic anhydride and propylene glycol which is cross-linked with styrene.

4. A board as claimed in claim 1, 2 or 3, which includes a lightweight core.

5. A board as claimed in claim 4, wherein the lightweight core is formed of a foamed plastics material.

6. A board as claimed in claim 5, wherein the lightweight core is foamed polyurethane.

7. A board as claimed in any one of the preceding claims, which includes wooden bracing members.

8. A board as claimed in any one of the preceding claims, wherein the board has a raised portion extending along one or both longitudinal edges.

9. A board as claimed in any one of the preceding claims, wherein a pigment is incorporated in the plastics material.

10. A board as claimed in claim 4, 5 or 6, wherein unidirectional continuous rovings are located within the board adjacent to the lightweight core.

11. A board as claimed in any preceding claim, wherein woven rovings form the reinforcement adjacent to one surface of the scaffold board.

12. A board as claimed in any preceding claim, wherein chopped strand mat forms the reinforcement adjacent to one surface of the scaffold board.

13. A scaffold board as claimed in claim 1, and substantially as hereinbefore described

14. A scaffold board substantially as described with reference to, and as shown in Figures 1 or 2 of the accompanying drawing.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1977.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

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1 SHEET

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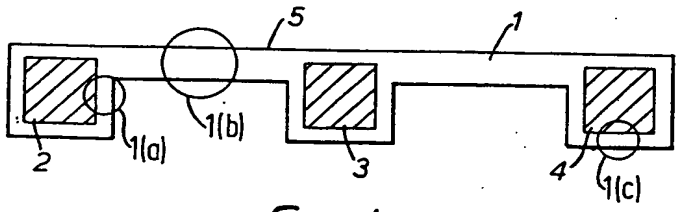

FIG . 1.

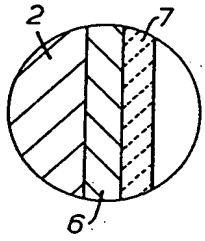

FIG. 1(a).

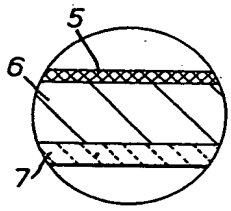

FIG 1(b)

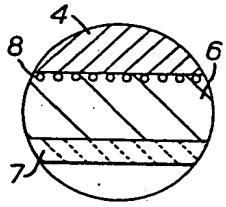

FIG. 1(c).

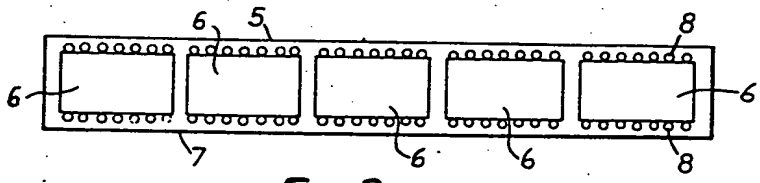

FIG. 2.